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EXAMINER	
KAU, STEVEN Y	

ART UNIT	PAPER NUMBER
2625	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/633,656	BOESTEN, HUBERTUS MARIE JOZEPH MATHIEU	
	Examiner	Art Unit	
	STEVEN KAU	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments see Amendment After Final filed 2/08/2008, with respect to the rejection(s) of claim(s) 1-19 have been fully considered and are persuasive. Therefore, the final rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Mahy (US 5,872,898) in view of Van de Capelle (US 7,123,380), Ito (US 6,801,339) and Dalal et al (US 5,892,891). In addition, the specification is objected to because the brief description of the drawings of Figure 4 does not match what is shown in the drawing, and Claims 14 and 18 are rejected under 35 U.S.C. 112, first paragraph for lack of adequacy disclosure to enable a person of ordinary skill in the art to make and use the claimed invention.

Regarding Applicant's Argument:

"However, contrary to the Official Action, Dalai does not disclose or suggest Applicant's claimed "selection of a halftone screen among a plurality of available halftone screens." Furthermore, contrary to the Official Action, Dalai does not disclose or suggest Applicant's claimed "said lists being consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space", third paragraph, page 4, 2/8/2008.

Examiners Response:

I. In re to "***selection of a halftone screen among a plurality of available halftone screens***."

Dalal discloses a printing apparatus capable to print a desired color as a combination of a set of colorants and a color space illustrating a principle of "hi-fi" color in Figure 1. Dalal disclose four-color sets of halftone screens used for colors Y (Yellow), M (Magenta), C (Cyan), K (Black). It have been well known in the art that each colorant or ink requires only one screen in halftoning process or printing with a desired angle, e.g. C=O=-15^0, and M=G=15^0, etc. (Fig. 1, col 8, lines 1-9, Dalal' 891). If Dalal does not select a halftone screen among a plurality halftone screen, how can his printing apparatus to print a desired color as a combination of a set of colorants?

II. In re to "***said lists being consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space***."

As discussed above, it is well known in the art that screen angles are attributes of halftone screens and four-color sets of halftone screens are used for a set or a list of YMCK, or subsets or lists, e.g. M & G, C & O, K of YMCK colorants and "hi-fi" colors. If Dalal does not teach or suggest "said lists being consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the color space", how can Dala's printing apparatus printing color images with extra colorants in addition to primary colorants as shown in Figures 1, 2, 3 & 4?

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns,* 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The examiner also references the applicant to the

claims rejection section below for the explanation on how the prior art references read on the amended claims.

Specification

2. The disclosure is objected to because of the following informalities: paragraph [027] of the disclosure, recites, "[027] Fig. 4 is an example of rendered graininess as a function of the toner coverage fraction for the given colorant Magenta." However, Figure 4 displays a flow chart and does not show "rendered graininess as a function of the toner coverage fraction for the given colorant Magenta" (emphasis added).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 14 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Claim 14 is directed to a printing system, limitations recite, "means for defining discrete colour points in at least a portion of a colour space; means for determining for the defined discrete colour points, different subsets of colorants and associated coverage fractions thereof, rendering each of said colour points, and calculating for each of said subsets an associated graininess value; means for determining lists of colorant subsets rendering the defined discrete colour points, said lists being consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space; and means for selecting one of said lists of subsets of colorants on the basis of a total graininess calculated for said lists". However, critical or

essential components, e.g. printer processor, memory and part D, etc. to the practice of the invention shown in Fig. 1 and paragraphs 0034 to 0040 of US 2004/0021886, are not included in the claim, and thus is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). See MPEP 2174. In addition, applicant attempts to invoke 112 6th in the claim. However, "means for" in the claim limitation does not meet the 112 6th requirement because applicant's disclosure does not provide any detail structural information for the means-plus function and the "means for" in the claim is modified by sufficient structure, material or acts for achieving the specific function. See MPEP 2181.

5. Claims 18 and 19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Claims 18-19 are directed to a computer program product. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. With respect to claim 9, recites, "A computer program product embodied on at least one computer-readable medium, for rendering colours in a printing system using a set of N colorants, including, for each colour to be rendered, a selection of a subset of M colorants whereby M < N and for each colorant of said subset, a selection of a halftone screen among a plurality of available halftone screens and a coverage fraction, the computer program product comprising computer-executable instructions for: defining discrete colour points in at least a portion of a colour space; determining for the defined discrete colour points, different subsets of colorants and associated coverage fractions thereof, rendering each of said colour points, and calculating for each of said subsets an associated graininess value; determining lists of colorant subsets rendering the defined discrete colour points, said lists being consistent with respect to the attribution of a halftone screen to a colorant within a

subset over said portion of the colour space; and selecting one of said lists of subsets of colorants on the basis of a total graininess calculated for said lists. 19. (Original) The computer program product according to claim 18, wherein the calculated total graininess for a list is a combination of the graininesses calculated for each discrete colour point of the considered portion of the colour space" (emphasis added). There is no computer program product, e.g. computer program codes disclosed in the original disclosure. It lacks of adequacy disclosure to enable a person of ordinary skill in the art to make and use the claimed invention. For the computer program product claim, both computer hardware and software must be sufficiently disclosed (MPEP 2161.01).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 2, 4-16 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahy (US 5,872,898) in view of Van de Capelle (7,123,380) and further in view of Ito (US 6,801,339) and Dalal et al (US 5,892,891).

Regarding claim 1.

Mahy discloses a method of rendering colours in a printing system (**e.g. a printer model, col 1, lines 48-65, and col 14, lines 13-160**) using a set of N colorants (**e.g. a set of colorants in n-dimension, col 1, lines 48 52**), including, for each colour to be

rendered (**e.g. Figs. 3 & 4, col 10, lines 5-16**), a selection of a subset of M colorants whereby M<N and for each colorant of said subset (**e.g. col 2, lines 4-11**), a selection of a halftone screen among a plurality of available halftone screens (**e.g. for a 3-ink process, three halftone screens are used; in the actual ink process, or printer model calculation, must select a halftone screen among the three screens, col 2, line 66 through col 3, line 5**), the method comprising steps: defining discrete colour points in at least a portion of a colour space (**e.g. point A in Figs. 3 & 4, col 10, lines 50-65**) ; determining for the defined discrete colour points (**col 10, line 50 through col 11, line 25**), different subsets of colorants (**e.g. col 11, lines 36-44 for three ink process, & four ink process in col 12, lines 36-67, & n-ink process, col 13, line 61 through col 14, line 12**), rendering each of said colour points (**e.g. Figs. 3 & 4, col 10, lines 5-16**); determining lists of colorant subsets rendering the defined discrete colour points (**e.g. col 11, lines 36-44 for three ink process, & four ink process in col 12, lines 36-67, & n-ink process, col 13, line 61 through col 14, line 12**), and selecting one of said lists of subsets of colorants for said lists (**e.g. subset of c1, c2 of said list c1, c2, c3 for three ink process, col 11, 36-44, and & four ink process in col 12, lines 36-67, & n-ink process, col 13, line 61 through col 14, line 12**).

Mahy does not explicitly disclose a coverage fraction, calculating for each of said subsets an associated graininess value, said lists being consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space; and selecting one of said lists of subsets of colorants on the basis of a total graininess calculated for said lists.

Van de Capelle teaches a colorant coverage fraction (**e.g. coverage percentage, or fraction of N colorants, Fig. 8 and col 6, lines 20-31 & col 8, lines 9-23**); and

Ito teaches calculating for each of said subsets an associated graininess value (**e.g. providing a graininess estimate method of Figs. 1 and 2, & col 14, line 5 through col 16, line 67 and so on, graininess value of a subset colorants of inks can be calculated**); and

Dalal teaches said lists being consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space (**Dalal discloses that different four-color sets of halftone screens would be used, each set using the same screen angles for complementary colors, col 8, lines 1-9**).

Having a method of rendering colours of Mahy' 898 reference and then given the well-established teaching of Van de Capelle' 380 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Mahy' 898 reference to include a coverage fraction as taught by Van de Capelle' 380 reference since doing so would be able to determine which set of ink printed at what surface producing a desired color (col 7, line 11-21, Van de Capelle) and further the coverage percentage calculation provided could easily be established for one another with predictable results; and then would have modified Mahy' 898 reference combining with Van de Capelle' 380 reference to include calculating for each of said subsets an associated graininess value as taught by Ito' 339, since doing so would be able to minimize graininess and thus good image quality could be reproduced (col 1,

lines 55-65, Ito) and the methodology of graininess calculation provided could be implemented with predictable result; finally, would have modified the combination of Mahy, Van de Capelle and Ito to include said lists being consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space as taught by Dalal' 891 for color complement with a predictable result.

Regarding **claim 2**.

Mahy discloses that a first colour point **(e.g. a color point A shown in Figs. 3 & 4)** is associated to the same said colorant **(e.g. colorant c)**, if present, in a subset rendering a neighboring colour point of said first colour point **(e.g. color point A is a color point in a physical boundaries lies inside the color gamut, col 10, line 50 through col 11, line 58)**.

Mahy does not disclose a list of colorant subsets is consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space if a halftone screen associated to a colorant in a subset rendering.

Dalal teaches wherein a list of colorant subsets is consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space **(See Claim 1 discussion)** if a halftone screen associated to a colorant in a subset rendering **(Dalal discloses that colors in the main gamut will be printed with a CMYK set of screens, while colors in the extended gamut 102 will be printed with the MYKO set of screens: in either cases, only four halftone screens need to be accommodated in a pattern on the printing surface. That is, each**

halftone screen is used for each colorant in either main or extended gamut – col 7, lines 19-35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Mahy to include a list of colorant subsets is consistent with respect to the attribution of a halftone screen to a colorant within a subset over said portion of the colour space if a halftone screen associated to a colorant in a subset rendering as taught by Dalal thus to complementing colors for printing.

Regarding **claim 4**.

Mahy discloses a list is a combination for each discrete colour point of the considered portion of the colour space (**Figs. 1-5, col 1, line 46 to col 2, line 11 and col 10, line 50 to col 11, line 44**).

Mahy does not teach calculating graininess.

Ito teaches calculating graininess (**Figs. 1 & 2, col 14, line 6 to col 16, line 32**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Mahy to include calculating graininess as taught by Ito to improve image reproduction quality (col 1, lines 55-65).

Regarding **claim 5**.

Mahy discloses each discrete colour point of the considered portion of the colour space is a combination of each colorant in the subset of colorants rendering said discrete colour point (**e.g. Figs 1-5, three ink process, col 11, 36-44, and & four ink process in col 12, lines 36-67, & n-ink process, col 13, line 61 through col 14, line 12**).

Mahy does not disclose calculating graininess.

Ito teaches calculating graininess (**Figs. 1 & 2, col 14, line 6 to col 16, line 32**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Mahy to include calculating graininess as taught by Ito to improving image reproduction quality.

Regarding **claim 6**.

Mahy does not teach wherein the selected list is the list showing the minimum calculated graininess.

Ito teaches wherein the selected list is the list showing the minimum calculated graininess (**e.g. the main idea of having minimum calculated graininess is to for inspection; however, Ito teaches a method and a device to inspect or estimate the level of graininess, col 9, lines 11-25**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Mahy to include the selected list is the list showing the minimum calculated graininess taught by Ito to obtain higher image reproduction quality (col 1, lines 55-65).

Regarding **claim 7**, the structure elements of method claim 6 perform all steps of method claim 7. Thus claim 7 is rejected under 103(a) for the same reason discussed in the rejection of claim 6.

Regarding **claim 8**, the structure elements of method claim 6 perform all steps of method claim 8. Thus claim 8 is rejected under 103(a) for the same reason discussed in the rejection of claim 6.

Regarding **claim 9**, the structure elements of method claim 1 perform all steps of method claim 9. Thus claim 9 is rejected under 103(a) for the same reason discussed in the rejection of claim 1.

Regarding **claim 10**, the structure elements of method claim 9 perform all steps of method claim 10. Thus claim 10 is rejected under 103(a) for the same reason discussed in the rejection of claim 9.

Regarding **claim 11**, the structure elements of method claim 9 perform all steps of method claim 11. Thus claim 11 is rejected under 103(a) for the same reason discussed in the rejection of claim 9.

Regarding **claim 12**, the structure elements of method claim 9 perform all steps of method claim 12. Thus claim 12 is rejected under 103(a) for the same reason discussed in the rejection of claim 9.

Regarding **claim 13**, the structure elements of method claims 6 and 9 perform all steps of method claim 13. Thus claim 13 is rejected under 103(a) for the same reason discussed in the rejection of claims 6 and 9.

Regarding **claim 14**, recites identical features, as claim 1, except claim 14 is a system claim. Thus, arguments similar to that presented above for claim 1 are also equally applicable to claim 14.

Regarding **claim 15**, Dalal teaches halftone screen (col 7, lines 19-35).

Mahy discloses a list of subsets of colorants rendering the colour points (**Figs. 1-5, col 1, line 46 to col 2, line 11 and col 10, line 50 to col 11, line 44**).

Mahy does not disclose a memory unit, coverage fraction and a look-up table.

Van de Capelle teaches a memory unit (**Fig. 5, col 12, lines 63-67**), a coverage fraction (**e.g. coverage percentage, or fraction of N colorants, Fig. 8 and col 6, lines 20-31 & col 8, lines 9-23**) and look-up table (**col 7, line 66 to col 8, line 8**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Mahy to include a memory unit, coverage fraction and a look-up table as taught by Van de Capelle to improve processing speed and reduce storage size of the color information of an image.

Regarding **claim 16**, recites identical features as claim 2, except claim 16 is a system claim. Thus, arguments similar to that presented above for claim 2 are also equally applicable to claim 16.

Regarding **claim 18**, recites identical features as claim 1, except claim 18 is a computer program product claim. Thus, arguments similar to that presented above for claim 1 are also equally applicable to claim 18.

Regarding **claim 19**, recites identical features as claim 4, except claim 19 is a computer program product claim. Thus, arguments similar to that presented above for claim 4 are also equally applicable to claim 19.

8. Claims 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mahy (US 5,872,898) in view of Van de Capelle (7,123,380) and further in view of Ito (US 6,801,339) and Dalal et al (US 5,892,891) as applied to claims 1 and 14, and further in view of Ebner (US 5,689,344).

Regarding **claim 3**.

Mahy discloses wherein a list of colorant subsets is a subset over said portion of the colour space (**e.g. subset of c1, and c2 are portion of 3-dimentional color space, col 11, lines 36-44**), in a subset rendering a neighboring colour point of said first colour point (**e.g. col 11, lines 36-44 for three ink process, & four ink process in col 12, lines 36-67, & n-ink process, col 13, line 61 through col 14, line 12**), and a first colorant in a subset rendering a colour point and to a different second colorant rendering a neighbouring colour point of first said colour point (**e.g. in a 3-ink process of 3-dimensional color space, Mahy discloses the relationship of color point and associated colorants and its neighboring color points, Figs. 1-6 and col 1, line 50 through col 2, line 29, col 11, lines 36-44 for three ink process, & four ink process in col 12, lines 36-67, & n-ink process, col 13, line 61 through col 14, line 12 and so on**).

Mahy does not teach attribution of a halftone screen, if a halftone screen associated to a colorant in a subset rendering a first colour point is associated to the same said colorant, threshold and coverage fraction.

Dalal teaches attribution of a halftone screen (**e.g. screen angles, col 8, lines 1-9**), if a halftone screen associated to a colorant in a subset rendering a first colour point is associated to the same said colorant (**Dalal discloses that colors in the main gamut will be printed with a CMYK set of screens, while colors in the extended gamut 102 will be printed with the MYKO set of screens: in either cases, only four halftone screens need to be accommodated in a pattern on the printing surface.**

That is, each halftone screen is used for each colorant in either main or extended gamut – col 7, lines 19-35).

Van de Capelle teaches coverage fraction (**e.g. coverage percentage, or fraction of N colorants, Fig. 8 and col 6, lines 20-31 & col 8, lines 9-23**).

Ebner discloses a threshold (**e.g. the halftoning system using a desired screen matrix have N number of threshold and N number of threshold values in a K x L matrix, each threshold corresponding to a printer signal in an image to be printed, the method comprising the steps of determining a percentage of coverage reduction required to mitigate tenting deletions, col 3, lines 10-27**).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified Mahy to include attribution of a halftone screen (**e.g. screen angles, col 8, lines 1-9**), if a halftone screen associated to a colorant in a subset rendering a first colour point is associated to the same said colorant as taught by Dalal for color complementary and image reproduction quality improvement; and would have modified the combination of Mahy and Dalal to include a colorant coverage fraction to minimize image graininess for better image reproduction quality; and finally would have modified the combination to include a threshold taught by Ebner to prevent printing of corresponding image signals, the percentage related to the coverage reduction percentage; printing a image signals for each threshold value which is exceeded in the screen matrix (col 3, lines 24-27).

Regarding **claim 17**, the structure elements of method claim 3 perform all steps of printing system claim 17. Thus claim 17 is rejected under 103(a) for the same reason discussed in the rejection of claim 3.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Kau whose telephone number is 571-270-1120 and fax number is 571-270-2120. The examiner can normally be reached on M-F, 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Steven Kau/
Examiner, Art Unit 2625
7/23/2008

/King Y. Poon/
Supervisory Patent Examiner, Art Unit 2625